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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/416,618 10/12/99 PAASCH

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EXAMINER

022879 MMC2/0301
HEWLETT PACKARD COMPANY
P O BOX 272400
INTELLECTUAL PROPERTY ADMINISTRATION
FORT COLLINS CO 80527-2400

ART. UNIT PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/416,618

Applicant(s)

Robert Paasch

Examiner

Charles W. Stewart Jr.

Group Art Unit

2853



☐ Responsive to communication(s) filed on _____.

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) 1-27 is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

☒ Claim(s) 23-27 is/are allowed.

☒ Claim(s) 1-5, 8-14, and 17-19 is/are rejected.

☒ Claim(s) 6, 7, 15, 16, and 20-22 is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☒ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been
☐ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____.

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 5

☐ Interview Summary, PTO-413

☒ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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DETAILED ACTION

Priority

1. Receipt is acknowledged of papers filed on purporting to comply with the requirements of 35 U.S.C. 119(a)-(d), which papers have been placed of records in the file.

Information Disclosure Statement

2. Examiner has acknowledged the Information Disclosure Statement filed November 23, 1999

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 1-9 and 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1, it is unclear how a signal is related to a misfiring of said ink expulsion?

Claim 2-9 are rejected because of their dependence to the rejected claim.

Claim 18, line 2, the word "determing" should be "determining".

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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5. Claim 1-3 is rejected under 35 U.S.C. 102(b) as being anticipated by Isayama U.S.P. 4,293,867.

As best construed, Isayama discloses a print head apparatus, comprising:
a substrate (fig. 1 is a substrate).
an ink expulsion mechanism provided on said substrate (fig. 1, element 3a and 3b); and
a first pressure sensor that is capable of detecting a signal related to a misfiring of said ink expulsion mechanism (col. 2, lines 7-11).

wherein said sensor includes piezoelectric material (fig. 1, element 2).

wherein said sensor is formed on said substrate (col. 1, lines 62-67).

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claim 4 is rejected under 35 U.S.C. 102(b) as being anticipated by Tanaka et al. U.S.P. 4,668,965.

As best construed, Tanaka et al. disclose a barrier layer formed on said substrate (fig. 5 shows a barrier layer formed on said substrate).

a cover plate having a nozzle therein formed on said barrier layer and positioned such that nozzle is aligned with said ink expulsion mechanism said substrate, barrier and cover plate defining an ink well (col. 3, lines 55-68 through col. 4, lines 1-6); and

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wherein said first sensor is provided at said ink well in such a manner as to detect pressure waves propagating in ink in said ink expulsion mechanism as set forth in col. 4, lines 6-10.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 5, 8, 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Widder U.S.P. 5,646,654 in view of Tanaka et al U.S.P. 4,668,965.

As best construed, Widder disclose wherein said first pressure sensor is an acoustic wave piezoelectric transducer as set forth in col. 5, lines 49-59). It is well known in the art to use piezoelectric for an acoustic wave transducer. *In re Ahlert*, 424 F2d 1088, 165 USPQ 418, 420 (CCPA 1970) MPEP 2144.04

However, Widder does not disclose wherein said ink expulsion mechanism is thermally actuated. Nevertheless, Tanaka et al. disclose wherein said ink expulsion mechanism is thermally actuated (fig. 4 shows the ink expulsion mechanism 70 is actuated in the area where heater 68 is connected across element 67). It would have been obvious to one of ordinary skill in the use the transducer of Widder with the ink expulsion mechanism as taught by Tanaka et al. in order to detect malfunctioning within the printhead structure.

Claim Rejections - 35 USC § 102

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9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claim 10-12 is rejected under 35 U.S.C. 102(b) as being anticipated by Tanaka et al.

U.S.P. 4,668,965.

As best construed, Tanaka et al. disclose a print head apparatus, comprising:

a substrate (fig. 1 is a substrate).

a cover plate spaced from said ink expulsion mechanism and having a nozzle formed therein, said nozzle being aligned with said ink expulsion mechanism (col 3, lines 55-68 through col. 4, lines 1-6); and

a sensor mechanism that is capable of determining when said nozzle is clogged/unclogged (fig. 4, element 70).

wherein said sensor mechanism is capable of determining when said nozzle is unclogged (col. 4, lines 52-61).

wherein said sensor mechanism is capable of determining one or more of the group of conditions including dry-fire and no-fire condition (col. 5, lines 12-23).

10. Claims 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Scardovi U.S.P. 4,498,089 in view of Yamamoto et al. U.S.P. 4,714,935 and further in view of Hubbard et al. U.S.P. 4,907,013.

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As best construed, Yamamoto et al. disclose a method of monitoring performance of a print head, comprising the steps of :

attempting expulsion of a volume of ink from a print head (abstract);

However, Scardovi does not disclose detecting within said print head a characteristic of a pressure wave generated by said attempt to expel said volume of ink. Nevertheless, Yamamoto et al. disclose detecting within said print head a characteristic of a pressure wave generated by said attempt to expel said volume of ink (col. 6, lines 43-57). It would have been obvious to one of ordinary skill in the art to combine the print head of Scardovi with detecting within said print head a characteristic of a pressure wave generated by said attempt to expel said volume of ink, as taught by Yamamoto et al. in order that the print head can be detected.

Yamamoto disclose the step of determining from said detected characteristic a status of said attempted expulsion of said volume of ink (col. 1, lines 27-32).

However, Scardovi does not disclose wherein said detecting step includes the step of detecting the presence or absence of a pressure wave. Nevertheless, Hubbard et al. disclose wherein said detecting step includes the step of detecting the presence or absence of a pressure wave (col. 6, lines 15-18). It would have been obvious to one of ordinary skill in the art to use the printhead of Scardovi with the step of detecting the presence or absence of a pressure wave, as taught by Hubbard et al. in order to represent the state of the corresponding nozzle.

Allowable Subject Matter

11. Claims 23-27 allowed

12. The following is a statement of reasons for the indication of allowable subject matter:

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The recitation of a interdigitated pressure wave transducer disposed on said substrate and having a direction detection characteristic whereby a pressure wave traveling in a predetermined direction from said at least one ink ejector is preferentially detected in independent claim 23. The recitation of detecting a second magnitude of a pressure wave in the range of 15% to 25% less than said first magnitude whereby a misfiring nozzle may be detected in independent. The recitation of detecting a second timing of an arrival of a pressure wave in the range of 15 to 20% earlier than said first timing whereby a misfiring nozzle may be detected in independent claim 27.

13. Claims 6-7, 9, 15-16, 20-21 and 22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claim 6-7, 9 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Contact Information

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Charles Stewart, Jr. whose telephone number is (703) 308-7252. The examiner can normally be reached on Monday-Friday from 8:30 a.m to 5:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John E. Barlow, Jr. Art Unit 2853, can be reached on (703) 308-3126. The fax phone number for the organization where this application or proceeding is assigned is (703) 305-3432.

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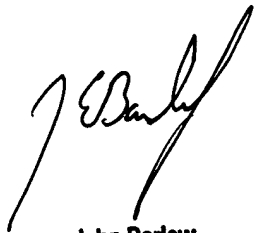
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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

cws



February 22, 2001



John Barlow
Supervisory Patent Examiner
Technology Center 2800